

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
6 May 2004 (06.05.2004)

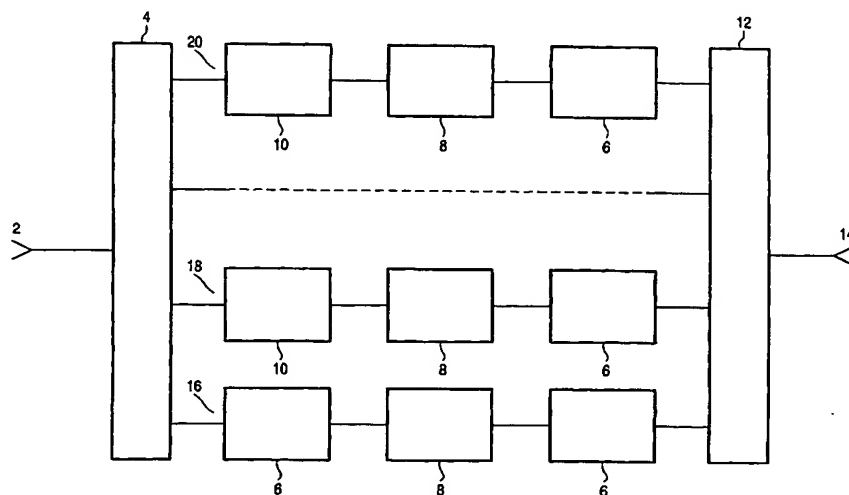
PCT

(10) International Publication Number  
WO 2004/038910 A3

- (51) International Patent Classification<sup>7</sup>: H03F 1/32, 3/60, 3/21
- (21) International Application Number: PCT/IB2003/004583
- (22) International Filing Date: 17 October 2003 (17.10.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 02079392.3 22 October 2002 (22.10.2002) EP
- (71) Applicant (for all designated States except US): KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): BLEDNOV, Igor, I. [RU/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: DUIJVESTIJN, Adrianus, J.; Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Declaration under Rule 4.17:**  
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH,

[Continued on next page]

(54) Title: PREDISTORTION LINEARIZING



(57) Abstract: A method for a predistortion linearization of a branched signal for a RF amplifier, comprising supplying a branched signal to at least one input terminal (2); distributing power of the input signal present on at least one input terminal (2) to a plurality of parallel branch-circuits (16, 18, 20) as a branched signals by a power distributing circuit (4); controlling a phase parameter and an amplitude parameter of the branched signals by at least one nonlinear branch-circuit (18, 20); controlling a phase parameter and an amplitude parameter of the branched signals by at least one linear branch-circuit (16); combining output branched signals of at least one nonlinear branch circuit (18, 20) with the output branched signals of at least one linear branch circuit (16) by a power combining circuit (12); providing an output branched signal of the power combining circuit (12) on at least one output terminal (14). Furthermore, a circuit for a predistortion unit linearizing a signal for a RF amplifier and a layout of a predistortion linearization of a signal for a RF amplifier are disclosed.



PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

**Published:**

— with international search report

(88) Date of publication of the international search report:

1 July 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 03/04583

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H03F1/32 H03F3/60 H03F3/21

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No.       |
|------------|--|-----------------------------|
| X          | EP 1 098 435 A (LORAL SPACE SYSTEMS INC)<br>9 May 2001 (2001-05-09)                | 1-3,6-15                    |
| Y          | column 3, line 49 - column 6, line 51;<br>figures 1,2                              | 4,5                         |
| X          | US 6 255 908 B1 (BEAUREGARD FRANCOIS ET<br>AL) 3 July 2001 (2001-07-03)            | 1,3,6-8,<br>10,12,<br>14,15 |
| Y          | column 5, line 10 - column 6, line 49;<br>figures 1,2                              | 5                           |
| A          | US 6 147 553 A (KOLANEK JAMES)<br>14 November 2000 (2000-11-14)                    | 1-3,5-15                    |
| Y          | column 3, line 44 - column 5, line 40;<br>figure 1                                 | 4                           |

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the international search

5 April 2004

Date of mailing of the international search report

16/04/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Fedl, G

# INTERNATIONAL SEARCH REPORT

Int. l. Application No  
PCT/IB 03/04583

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s)   | Publication<br>date  |
|---|----|---------------------|--|--|
| EP 1098435                                | A  | 09-05-2001          | US 6188279 B1<br>EP 1098435 A1<br>JP 2001144551 A  | 13-02-2001<br>09-05-2001<br>25-05-2001   |
| US 6255908                                | B1 | 03-07-2001          | NONE   |  |
| US 6147553                                | A  | 14-11-2000          | US 5886573 A<br>AU 8692198 A<br>EP 1092265 A1<br>JP 2002506309 T<br>WO 9945642 A1<br>US 6215354 B1 | 23-03-1999<br>20-09-1999<br>18-04-2001<br>26-02-2002<br>10-09-1999<br>10-04-2001 |